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ABSTRACT

This discussion treats the state-owned institutions of Pennsyvania as an educational system. Justification for such a view is traced in the historical roots, legal and functional development, and current mission of these institutions. To assess the effectiveness of this system, enrollment patterns and degree output are examined, first in comparison with state and national patterns, then as a ratio that is a measure of efficiency. Taken together, these indexes emphasize the strength of these institutions and point toward the next step in their development. (Author)

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Pennsylvania's "State-Owned" Institutions: Some Dimensions of Degree Output

William Toombs and Stephen D. Millman

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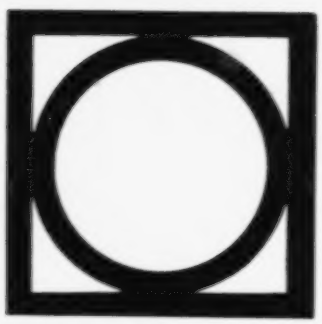

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INTRODUCTION

The state-owned institutions of Pennsylvania have an identity of their own created from a history that is in part similar to the state colleges in other states and, in part, quite distinctive. They have had a major place in the extension of higher education to citizens of the Commonwealth and in the cultivation of professional competence in the schools. Their current importance lies in an imminent departure from this tradition rather than its continuation. A major change in the role of state-owned institutions has been in the making for half a dozen years but it is still in embryonic state. Unlike changes in the past which have often been shaped by demographic trends or accidental events, the next directions will be a product of policy decisions. Only a variety of viewpoints and a range of analyses, this study is one, can inform these decisions with facts.

The paragraphs that follow treat the state-owned institutions as an educational system. Justification for such a view is traced in the historical roots, legal and functional development, and current mission of these institutions. To assess the effectiveness of this system, enrollment patterns and degree output are examined, first in comparison with state and national patterns, then as a ratio that is a measure of efficiency. Taken together, these indexes emphasize the strength of these institutions and point toward the next steps in their development.

I. TAKING A POINT OF VIEW

The time is one in which every formal institution is subject to close scrutiny. Under waves of bold, often radical, criticism we want to know what schools, colleges, hospitals, the courts, even churches, are doing and with what effect. In the search for ways to know what is happening, we are confronted with the more fundamental problems of what to look at and how to see.

A. The Full Perspective

Scientific tradition presses toward the reductionist approach and atomistic analysis. Experience in the physical and biological sciences encourages examination of the component parts of an issue and the measurement of carefully defined phenomena related to it. More and more, however, the needs of our age seem to require a holistic view, a perspective that will capture the full scope of activity. An analogy for these two approaches is found in the difference between a world seen through a magnifying glass which enlarges the detail but narrows the scope and the 'fish-eye' lens which concentrates the cyclorama into a single image. Somehow we were led to feel that the magnifying glass told us more but now we find that the total view has its utility too.

In higher education, the search for a comprehensive view has generated a great deal of interest in systems analysis and in global indicators that reflect a summary of the process of education itself. This search has proven to be surprisingly difficult.[1] One of the long-established indicators is degree output and, when appropriately interpreted, it can offer a measure of insight into the operation of an institution, a program, or a collection of institutions.

This study concentrates upon degree certifications at the bachelor's level as a means of gaining perspective on the activities of the state-owned institutions in Pennsylvania. Also included is a collection of descriptive information, much of it in new form, about the number of bachelors' recipients who eventually appear in the Annual Survey of Current Doctorates.

B. State-Owned Institutions

For several reasons, the state-owned institutions are highly suitable subjects for this kind of study. Their histories show many similarities from the time they became normal schools. These commonalities have been reinforced by subsequent policies and patterns of growth. Many of the major decisions about these institutions are relatively recent, within the last forty years, and we are fortunate in having enough information over that time span to construct a set of basic facts on enrollment and degrees. The data become a medium through which we can look at the similarities and differences among these colleges, their relationship to other kinds of institutions in the Commonwealth, as well as to national norms, and, most important, their progress over time. This material also suggests certain inferences about the policy decisions which have affected these institutions. Like most exploratory studies, its most interesting aspects lie in the questions for further study that arise from the results.

Underlying the study are two assumptions that require some explanation. First, the state-owned institutions are considered to have the attributes of a functional system. Second, the number of degrees, specifically in relation to enrollment, is an appropriate indicator of an educational system. The first of the sections that follow provides a brief summary of the history of the subject institutions and concludes with some reasons why they may be regarded as a system. Another section treats the possibilities and limitations of degree output as a device for reflecting the undergraduate educational process. Data on enrollments and degrees will be followed by data on baccalaureate origins of doctorates. Finally, acting on the scholar's license, some inferences will be drawn.

II. HISTORICAL NOTES ON THE STATE COLLEGES OF PENNSYLVANIA

Like most vigorous institutions, the state-owned institutions have a coherent history of their own and they also hold a role in the history of the Commonwealth. Some of the major recurring themes of that history can be

offered as an introduction, and a summary as well, to the more detailed discussion that follows:

A. Summary

1. There is ample evidence of strong commitment to higher education throughout the history of the Commonwealth.

2. Tied to this commitment has been an aversion to centralized control of higher education.

3. The early and continuous practice of aid to private and quasi-public institutions of higher learning undertaken in a variety of forms fits with the two basic views listed above.

4. While the Commonwealth has never failed her colleges and universities, the aid has always come *post facto* often at the point of dire emergency.

5. The colleges and universities now identified as state-owned institutions have a strong tradition of response to the educational needs of the Commonwealth.

6. In developing these responses, they have moved steadily toward a condition of similarity. When the budgeting, management, and review practices introduced for these institutions during the last twenty years are added to the older tradition, we find many of the attributes of a coordinated educational system manifested.

7. The integrated nature of this 'system' of institutions is visible in the data on enrollment and degrees. This data also confirm the view that these institutions have departed their traditional stereotype and are involved in the creation of a new identity.

B. The Basis of Public Interest

Higher education has seldom had sustained support in the American Republic on the grounds of its commitment to esoteric learning. The linkage of college and university with the public weal has always had utilitarian ends in view. The sectarian college was expected to produce preachers with theological purity. The seaboard universities were expected to mix enough navigation and surveying with Euclidean geometry to keep ships afloat, land tenure clear, and account books balanced. Technical and scientific schools followed the visions of van Raenssalaer, Carnegie, Pratt, Drexel, and Cooper who saw the useful linkage of science, learning, and industry through technology. And through all the years ran a concern for preparing teachers who could advance the young beyond the knowledge state of their struggling parents. It is the thread of this last tradition that many state colleges follow.

In some ways, the development of the state colleges of Pennsylvania mirrors the historical pattern in other states. Dunham portrays that development in its national character as follows:

> *If the institution is very old, it is likely that it was founded as an academy or seminary and then evolved into a normal school during the period when most normal schools were being founded. . . . The normal school to prepare elementary teachers becomes a teachers' college to prepare secondary as well as elementary teachers. Then, as the state seeks to respond to increasing demands for higher education, the teachers' college expands its function to become a multipurpose state college and perhaps a university.*[2]

While the state colleges of the Commonwealth have followed the general pattern described by Dunham, certain characteristics distinguish Pennsylvania traditions from those of other states. Several well-known works speak to these differences.[3]

C. The Pennsylvania Patterns

In Pennsylvania, as in many of the older states, support for education from public funds had a peculiarly passive role. No institution of higher learning in the Commonwealth was founded as a public institution.(The community

colleges are the recent exception.) Even the land–grant university, Penn State, owes its beginnings to private subscriptions. The fact that it is the only one of five land–grant institutions founded in that manner to survive portrays another aspect of the Pennsylvania tradition. Reluctance to found institutions did not translate into unwillingness to preserve institutions. Concern for their survival was strong and, when the occasion demanded, grants were made from public funds. The College of Philadelphia (University of Pennsylvania) and Dickinson College received emergency grants before 1830.[4] In ensuing years, assistance from the Commonwealth took many forms but it never quite reached the point of being a 'program' or 'system' of aid to higher education. William A. Cornell, in his account of financing for higher education, makes the point succinctly:

'The Commonwealth of Pennsylvania is unique in that it has supplied some financial aid to some institutions of higher education from time to time since the beginning of the State. No other state has a practice of state aid that is anything like that of Pennsylvania.[5]

The starting point for considering the historical lineage of the state colleges lies in the 1830's. Before that date and well into the nineteenth century, education at every level beyond the most elementary was viewed as a private matter and a family responsibility. An exception to this view, although distant from the New World, was well known.

The idea that education was a function of the state obtained in only one Western country – the Kingdom of Prussia.... In America, meanwhile, education (in the eighteenth century) continued to be regarded as a private or semi-private enterprise, a responsibility left by the government to the church and the parents. [6]

If schooling was a private matter, then it followed that the provision of teachers for the schools was also a private concern. Describing the early 1830's in a neighboring state, Dunham indicates:

There was agreement about the need for teachers, but disagreement about who should train them – the existing academies or a new system of publicly financed state normal schools. The normal school idea smacked of Prussianism and strong central government.[7]

The Prussian approach to both education and teacher preparation did, however, gain favor in the rest of the Germanic states and in France. The English, from whom most of our early traditions stem, resolutely held to the notion of education and teacher training as non-public matters.

When the question of establishing special schools for training teachers was taken up seriously in Pennsylvania, the advocates of such schools had a choice between. . . the state-supported and state-controlled systems of Germany and France, and. . . the privately-controlled, individualistic, decentralized plan of England. The former was best known and best advertised in American, and it was the one adopted, with modifications, by Massachusetts and the other states, but the English plan was the most attractive to the decentralized, heterogeneous, individualistic people of Pennsylvania. This was the most German of the states, but it was also the most decentralized and even the German settlers had no desire to go back to the Prussian centralization from which many of them had escaped.[8]

Whether for this reason or some other, Pennsylvania set out very early on a course of recognizing and, at various times, financially assisting institutions of higher learning.

III. STEPS TOWARD PUBLIC RESPONSIBILITY —

A. Private Grants

Just as the great awakening of the eighteenth century spawned Princeton, Brown, Rutgers, and Dartmouth, so new forms of public consciousness in the 1820's and 1830's generated new colleges and academies. This time the ideational forces mixed religion with Jacksonian democracy and with an urgent sense of progress. Education participated fully.

During this period, momentum began for what has been called 'the free school movement.' New schools were built, new methods and new concerns for pedagogy were developed, and many educators attempted to stir the public, seeking support for more comprehensive education.

In 1830, the trustees of Washington College established a Professorship of English Literature. 'The educational press hailed the creation of what it called 'a professorship of education' in a Pennsylvania college.'[9] One year later, the General Assembly of the Commonwealth acted by granting the college $500 annually for five years on the condition that 'the said trustees shall cause to be instructed twenty students, annually, free of expense of tuition for the term of five years; such students to be selected by said trustees, and taught in the elementary branches of an English education in such manner as said trustees shall deem best calculated to qualify them for teachers of English schools.'[10]

With the grant to Washington College, the General Assembly took cognizance for the first time of a public responsibility to provide teachers for the common schools. The grant to Washington College was followed in later years by appropriations to other liberal arts institutions pledged to training future teachers, including Jefferson College, Reading Academy, Pennsylvania College (Gettysburg), Allegheny College, and Marshall College.[11]

Financial encouragement to existing liberal arts institutions to establish teacher preparation programs seemed like a natural solution to the very pressing need for teachers. As Borrowman points out:

> *One can well argue that teacher education is among the oldest functions of the liberal arts college and university. The arts degree awarded by the medieval university was, as is generally known, a certificate of admission to the guild of professional teachers. . . . In the colonial and early national periods, then, the course of the liberal arts college probably contained the best available knowledge relevant to the education of teachers.*[12]

As the case has often been, it was the magnitude of the problem which forced public action. Private colleges in Pennsylvania could not provide the numbers of teachers needed to support the continuing expansion of the common schools. In 1837, Thomas Burrowes, then Superintendent of Common Schools for the Commonwealth, critically assessed the situation.

> *The colleges have already been tried as a means of supplying teachers and with little success. Within the last eight years, $48,500 have been given by the State to five of these institutions, principally on the condition that they should instruct a certain number of persons. . .for teachers of English schools. . .. It is doubted whether there are, at the present moment, in the whole State one hundred persons thus educated, permanently and actually engaged as teachers of primary schools. Hope from this quarter is dead.*[13]

B. Public Action

One year later, Burrowes put the matter more bluntly and suggested an alternative course of action.

> *The want of more and better teachers is by far the greatest difficulty of the system. . .. [I have] come deliberately and unhesitatingly to the conclusion that the best mode is the establishment of SEPARATE FREE STATE INSTITUTIONS for the instruction of teachers. [Emphasis his.]*[14]

Caution held the day, however, and it was 1857 before sufficient interest could be gathered to produce legislative action. In that year, a law was passed to establish twelve normal school districts in the state, each of which could charter a normal school. Though known as 'state normal schools,' each institution was to be privately owned.[15]

It was not so much a direct solution to the

problem of teacher shortage as an experiment in economy. The state did not intend to bear the costs of the normal schools.

The money to conduct the school was expected to be collected from school districts who would send students to the schools on district accounts. In return, the students were expected to return and teach for three years in the district. . .. The system did not work out for no school reported more than one or two students on such accounts. [16]

Sack points out that the law did provide a governance pattern for these institutions which reflected public concern but stopped short of a state funding scheme. In fact, the law specifically stipulated that 'the pecuniary interests of each of said schools shall be managed, and the general control exercised by a Board of Trustees. . .to be chosen by the contributors or stockholders.' The act, according to the Superintendent of Common Schools, 'simply contemplated the establishment of a certain number of private institutions for the training of teachers under some general State supervision. The State, at first, made no appropriations to them and designed to make none.'[17]

Each school had to be incorporated and funded by local stockholders, so there was delay in many areas. A number of academies were functioning adequately at the time of the Normal School Act and with slight revisions these schools could apply for recognition under the law. The first normal school was acknowledged in 1859, but it was 1893 before all twelve districts had a normal school chartered.

The twelve normal schools set up under the Act of 1857, and their dates of recognition are as follows:[18]

Millersville	1859	Shippensburg	1873
Edinboro	1861	California	1874
Mansfield	1862	Indiana	1875
Kutztown	1866	Lock Haven	1877
Bloomsburg	1869	Slippery Rock	1889
West Chester	1871	East Stroudsburg	1893

A thirteenth district was formed when it was discovered that there was a petitioning group in Clarion seeking recognition although there was already a recognized normal school in the same normal school district (Lock Haven). Clarion was recognized in 1887.[19] The constellation of institutions was completed in 1907 when Cheyney Institute for Colored Youth began to receive state aid.[20]

In pursuit of a policy that is curiously modern in its overtones, the Commonwealth, at the time of the Civil War, began to provide support to individual students through capitation grants. Starting in 1866, funds were appropriated by the General Assembly to be used for those students who signed a declaration that they intended to teach after graduation.

This *quid pro quo* for students in teaching fields never extended to other supported professional programs – medicine, veterinary study, agriculture, or law – but it persisted in the teacher institutions until the 1960's. In 1874, another major step was made. Pennsylvania adopted a new constitution which made the normal schools a part of the public school system. The institutions remained private, but the State paid, in addition to the student subsidy, a share of the costs of maintaining the schools. Financial interests of the State in these schools increased; so did the control.

. . . As the Legislature began to pour funds into the State normal schools, it soon reached a point where it had 'more money invested in some of the normal schools than have individuals, and about as much in others, and a policy has been forced upon it, not at first contemplated, of demanding a direct voice and vote in their management' [in the words of the Superintendent of Common Schools, 1873]. [21]

In the year 1911, a new comprehensive school code was enacted. One provision of the act allowed for the purchase of normal schools by the State.

Section 2032: In order that the State Normal

Schools may be owned and controlled by the Commonwealth, for the better preparation of teachers, the State Board of Education is hereby authorized to inquire into the propriety of purchasing any State Normal School, and if it is found that the stockholders, or other owners thereof, are desirous of selling and conveying the property of any such institution to the Commonwealth, it shall be the duty of the State Board of Education to make the most advantageous arrangements possible for the purchase of same.[22]

The final step toward making these teacher preparation institutions a responsibility of the State was soon taken. After the law was passed, but before any school had been purchased, Holland wrote:

> *With the exception of Delaware, Tennessee, Alabama, and Florida, all states of the Union maintain separate normal schools for the training of teachers which receive funds from the public treasury. In Pennsylvania alone, these schools are private corporations over which the State exercises little effectual control.*[23]

The dates and prices of purchase of the State Normal Schools are as follows:[24]

West Chester	1913	$ 78,000
California	1914	136,138
Edinboro	1914	58,497
Lock Haven	1914	94,000
Bloomsburg	1916	161,000
Clarion	1916	69,653
Slippery Rock	1916	42,775
Kutztown	1917	252,000
Millersville	1917	59,000
Shippensburg	1917	38,100
East Stroudsburg	1918	172,665
Indiana	1920	299,700
Mansfield	1920	176,870
Cheyney	1921*	

[*A separate law was enacted in 1921 to authorize the purchase of Cheyney.]

C. State Teachers' Colleges and After

By the time that the last private normal schools were being purchased by the Commonwealth, arrangements were being made to convert them into degree granting collegiate level institutions. Legislation was passed in 1921 (the Edmonds Act) to allow change to state teachers' college status, and the first schools were ready to be so certified in 1926. One year later, the remaining institutions became state teachers' colleges.

In 1961, the state teachers' colleges became state colleges. The change in name was not merely a semantic adjustment. The enabling legislation specifically set the directions for new programs:

Section 2003: . . .Their purpose shall be to serve as institutions and centers of learning for the best possible education of the youth of Pennsylvania in the arts and sciences and the education of teachers and for such other purposes as may be determined by the State Council of Education.[25]

To fulfill this new status, each institution took aboard a mentor from an established liberal arts college and by 1964-65 the new institutions had developed new programs for non-education majors. The forms these programs assumed was not a replica of the traditional liberal arts but a more generalized study pattern and the degrees were granted in 'Humanities,' 'Social Science,' and 'Natural Science' rather than in discrete disciplines. The unworkability of both nomenclature and program led to the creation of a disciplinary major in English in most institutions and to the construction of programmatic majors in other fields. Official acknowledgement of the *de facto* condition came slowly with blanket approval for twelve disciplinary majors arriving in September 1970.

Ten years after the State College Act, the state-owned institution was treated in the

Master Plan 1971 which had as a principal objective:

to define institutional roles and relate them to the needs and resources of the Commonwealth. [26]

The mission assigned to the state-owned group has a peculiarly limiting implication stating:

to provide baccalaureate programs in the general arts and sciences *and in* education *with increasing emphasis upon upper division work to allow for community college transfer students.* [Emphasis added.]

The idea of limiting state-owned institutions to a role only slightly removed from the teacher training tradition persisted in the State Council interpretation in 1961 and the Master Plan in 1971. But to continue it further diverts attention to the more urgent issue of how this valuable educational resource can be applied to meet the upcoming needs of business, education, technology, science, and humanity itself within the Commonwealth.

IV. THE STATE-OWNED INSTITUTIONS AS A SYSTEM ——

One reason for the popularity of the notion of a 'system' lies in the flexibility of the term. It permits sophistication or simplicity depending upon the level of abstraction and the degree of elaboration. *'A system is a set of objects together with relationships between objects and between their attributes.'* [27]

> *System theory is basically concerned with problems of relationships, of structure, and interdependence rather than with the constant attribute of objects.* [28]

Both of these statements emphasize the characteristics which encourage an observer to treat the state-owned institutions of Pennsylvania as a system. It is the relational quality. Over the years, a number of forces have acted to bring these institutions into a kind of network which, in spite of their apparent autonomy, links them into a common destiny. First, there is the force of history touched upon in the previous paragraphs and confirmed by common legal status. Then there was the budgeting practice which placed all these institutions together with the public school appropriations. Common standards of construction have been used by the General State Authority to specify buildings and equipment. Allocating special programs—music, physical education, library science—among the institutions recognizes their systemic nature. Academic programs receive the same review under the same criteria. What data there are on student characteristics show considerable similarity from one campus to another. Lately, we have the unusual linkage of a common union contract for faculty at all these institutions.

The unique aspect of this system is that the relationships needed to fulfill the definition arise from common operational patterns rather than from a formal, centralized administrative structure. The state-owned institutions give an appearance of considerable independence in their operation but the conditions under which they act insure a narrow range of outcomes. It is a system in its operations and in its effects. It is a system that has evolved rather than a system that has been designed.

For this study such a conclusion stands as an assumption. Acting upon it we are able to aggregate indicators such as enrollment, degrees for all these institutions and treat them as a system output.

V. DEGREE OUTPUT AS A MEASURE OF SYSTEM EFFECTIVENESS ——

Education at every level is forever suspended on the horns of a dilemma. In its essential aspects, the process of learning is an intensely personal one. Intellect grows, independence increases, sensitivity is refined, and skills develop within the individual who is at once the subject and object of education.

Of almost equal importance and of more

common concern is the collective aspect. The settings in which instruction is given, the social interaction and structure that characterize them, and the summary of its outcomes are important. For purposes of planning, management, reporting, and evaluation, the institutions of education have identities of their own. We make substantial assumptions about the relationships between the individual and the institution but they are seldom completely acceptable. Much of the contemporary criticism of education strikes at incongruities between the individual's needs and the institution's attempt to meet them.[29]

A. Degrees As An Indicator

In using degree output as an indicator, however, we accept the assumption that the individual experience and the institutional program are two sides of the same coin. The approach emphasizes that individual outcomes are thoroughly consistent with the total design. The degree represents a focal point at which interests of the individual, the society, and the institutions come together. It has a special legal status. It is the object of both student and faculty intentions. It is the terminal and summary point for curricular programs. In short, the awarding of a degree is the end product of a long chain of relationships based upon logical assumptions. Some may be wrong and others may be criticized but the principal features are still sound.

As a means of observing performance in a group of related institutions over time, the measurement of degree output has much to recommend it. Degrees are discrete units that are officially and quite accurately recorded.[30] As a matter of fact, they are probably tallied with more precision than any other datum in higher education. Degrees as a measure have all the characteristics suggested by David O. Brown.[31]

(1) Quantifiability. Output must be stated in quantifiable units.

(2) Additivity.

(3) Divisibility. The measures selected for the system as a whole must be equally available and meaningful for subsystems.

(4) Transferability. The measurement system appropriate for four-year colleges must also be appropriate for universities and for junior colleges.

(5) Consensus Acceptability. The measures should be credible. A majority of all constituencies should agree that the measures are not inappropriate.

(6) Flexibility. The model must be flexible so that users with different purposes and with different values can employ it for their own purposes.

Apart from simple convenience as a measure, there are deeper and broader implications, both educational and social, to this output. The degree is more than a single point on the flowing curve of educational development. It is a step change announcing the *completion* of training, the certification of competence within a range of recognized standards, and the credentialing or licensing of that competence so that it can be applied over a wide area.

As David W. Breneman noted, 'The decision to measure university output by degrees awarded directs our attention to an obvious but important distinction. Universities are engaged in two closely related but conceptually separable activities, education and certification. By defining degrees as the output measure, we are explicitly concentrating upon the university's role in certification as opposed to education.'[32]

British analysts of university performance have accepted this quantum jump in educational value . . . . The economic value of university education to the student attaches in the early years mainly to *completed degrees*. A student who drops out, or is thrown out for inadequate work, gets little or no early economic value for the work he has performed.'[33]

In American higher education, acceptance of the full importance of degree completion has

come more slowly mainly because any amount of college has had some palpable economic advantage. As the varieties of degree options increase and as community college programs expand, this tolerance for non-completion may decline. In some respects, this re-evaluation is already with us:

> *For many purposes, the fact of earning a B.A. degree . . . may be more important to the student making his way in American society than the reputation of the institution where he earned it, or how well he did relative to his classmates, or what he actually learned. . . . For an institution, the number of earned degrees produced in each type and level of program is an important measure of achievement.*[34]

The degree is also the designed objective of an educational program. It is the goal toward which courses and curricula are pointed. Even further, it has a relational value with respect to other degree designations on the same level as well as those above and below in the whole broad system of higher education. Society perceives the attainment of a degree as the *raison d'etre* of higher education. In at least one contemporary proposal for funding dollars per degree was suggested as the medium of reimbursement.[35]

Attainment of a degree is also the outcome intended by all the participants. Faculty who plan the learning environment and participate in it along with the students have the degree as an intended outcome. In comparison with other nations, it is also clear that our higher educational system is concentrated on training as many individuals as possible to a level of certifiable competence rather than upon screening out functions.[36]

Degree output is also a good indicator of the educational process in that it is sensitive to a variety of internal changes. If the calendar is altered, if fees rise rapidly, or if course requirements are radically revised, the ultimate effects will be reflected by the number of degrees awarded.

In summary, degree output may be taken as a suitable indicator of undergraduate study because it reflects program design, societal expectations, and the intentions of both faculty and students.

Because 'going to college' has its own social value and because of the relatively low completion rates, American higher education has been slow to accept degree output as an index of institutional performance. But if 'measurement without theory is a delusion', then we must acknowledge degree production as a measure for it is the focus of our theory; the objective of its educational concepts, intentions, and processes.

VI. SOME REFINEMENTS OF THE DATA

A. A Standardized Measure

While the absolute number of degrees produced may be useful for some purposes, we really need a way of standardizing this output for comparison over time and across institutions. Fortunately, throughout the period under study, the time required for completion of a baccalaureate program, four years, was just about the same at all undergraduate institutions. This stability provides a neat arithmetic relationship between enrollment and degrees. If all entrants received a degree four years later and new freshmen were constant in number, the ratio of enrolled students to degrees awarded would be a simple 4:1.[37] We know that a ratio as low as this is unlikely and the sources of variation come readily to mind.

The most obvious is the large increase in enrollments—very rapid at some times, slower at others—but continuously upward except for the World War II years. The ratio of degrees to enrollment can be used simply as suggested by Harris or Griffiths:

> *A university may be represented in a simple model as an input, black box, output system: the input consisting of students, resources, facilities, etc. is passed through . . . an educational process (the black box) and one output*

is the number of persons earning a degree. . . .In order to compare outputs from different systems and sub-systems, the numbers may be standardized by dividing the number of degrees by the number of students. [38]

'One approach to analyzing the performance of higher educational institutions is to regard the output of graduates with degrees as a principal product of such institutions and to consider the ratio of degrees produced to degree-credit enrollment as a measure of an institution's economic efficiency.'[39]

Or it can be applied in more complex form. One analyst, Robbin Hough, has cited the relationship of students enrolled to degrees granted as a useful expression of the 'production function' of institutions of higher learning. From his own studies which treated the effects of scale on this ratio, he offers the following general observations:

These ratios may be compared with an 'idea ratio' of 4.0 for a four-year undergraduate institution. These are considerable variations in the average productivites observed among the 75 institutions studied. . . (They) range from a low of 3.8 to a high of 11, with a mean of about 6. [40]

Drop-outs raise the ratio and the later they leave the higher the index goes.[41] Transfers in at the upper division would give the appearance of an improved ratio. Fortunately for the simplicity of our data, the influence of students who completed the first two years at a community college before entering a state-owned college was small during the period covered by these data.

B. Corrections for Enrollment Change

The influence of changes in enrollment upon the ratio is too sharp to go uncorrected. Rapid rates of increase in the number of entering students would have the effect of raising the ratio. To dampen this influence—it cannot be wholly eliminated—a moving five year average of enrollment has been used as a base. Why five years rather than four? Studies have shown that the mean time for completion of the baccalaureate is about 4.7 years with only half the students finishing in the prescribed time and thus the five-year period relates degrees to the most representative population.

A second correction has also been introduced to standardize degree output for the effects of enrollment. That share of degree output which is attributable to a rise or fall in enrollment is deducted or added before the ratio is calculated.

We can conclude, then, that the ratio of enrolled undergraduate students to degrees awarded, adjusted for perturbations in enrollment and corrected for the effects of enrollment change on degree output, is a good reflection of factors that act upon the students' educational experience. Comparisons among institutions over time by this method are reasonable and can be interpreted quite readily.

C. Sources

A note must be made on the source of the data. There is no single continuous official record of these data and, as is usual over a forty-six year span, definitions change. The reports of the Superintendent of Public Instruction were used for years 1930 to 1967 and the Secretary of Education's reports for recent years. Missing enrollments and degrees awarded were gathered directly from the registrars of the respective institutions and we are grateful for their prompt response. Definitions are troublesome in the early years but the totals represent certifications that are equivalent to four-year baccalaureate programs in years when the transition from diplomas to degrees occurred. The reporting base for enrollment shifted from spring to fall in the mid-fifties. To increase continuity, estimated data were introduced to cover the seventeen month gap that resulted.

VII. SUMMARY OF DATA

A. The Unique Decade

Growth in college enrollments during the

1960's was so large and so rapid that it exceeded every historical precedent. With equal certainty, it can be said that the conditions will never be duplicated. A confluence of social forces acted to raise these peaks, high birth rates from war-delayed, and depression-postponed marriages, increased high school completion rates, economic optimism, and strong tides of social aspiration. Not only is it unlikely that these factors will appear together again, but a new set of preferential stays on fertility have emerged in the form of birth control practices and public concern with overpopulation. However, growth in higher education will not cease. A substantial 55 percent increase in bachelor's degrees is anticipated for the 1970-1981 period on the national scene. Pennsylvania projections show an increase in baccalaureates from 47,321 to 69,400.[42]

A look at some of the effects of the past decade will give a better perspective for planning. The events of the 1960's produced a new order of relationships in the Commonwealth and the main outlines are described by the following information on enrollments, degrees, the ratio between them, and doctoral origins.

B. Enrollments (Figures 1 & 2)

Enrollments at the undergraduate level for the State can be viewed in terms of size or in terms of rates of change. Over the long span from 1925 to the latest year of record, 1971, the size of enrollment at state-owned colleges increased 8.8 times from 6,851 to 60,499 (Table 1). In the latest ten-year period, 1961-71, state-owned institutions increased by a factor of 2.6. All Pennsylvania undergraduate enrollments in the same decade grew from 127,505 to 274,476, a factor of 2.2. For the United States,as a whole, the growth factor was 1.9. State-owned institutions enrolled an increasing share of the undergraduate students rising from 18 percent to 21 percent over the decade.

Among the state-owned institutions, the greatest growth occurred at Edinboro, Slippery Rock, and Mansfield, in that order, while smallest increases (Figure 1) appeared at East Stroudsburg, Lock Haven, and California. The annual rates of change for these institutions also display some interesting differences (Table 5, Figure 4). Most marked has been the high rates of growth at Indiana University and Edinboro, two institutions that moved into branch campuses in the early sixties along with Clarion. The traditional leadership of West Chester passed to the new Indiana University in 1955. Throughout, Cheyney has had slow development compared to the other colleges in the group. All have moved at a rapid rate since 1965 and only in 1971 was there a perceptible downturn in enrollments (Table 5).

Undoubtedly, this pattern of growth reflects acts of public policy rather than simple demographic pressure. High school graduations alone do not account for it. They took a substantial jump in 1965 but then dropped back to a lower level for three successive years. It was the broader range of academic offerings, construction of new facilities, new funding levels, and student aid provided by PHEAA or federal sources that made it possible for citizens of the Commonwealth to enroll in these institutions of higher learning.

C. Degrees (Figure 3)

Inevitably the pattern of degree output for the state-owned institutions is quite similar to enrollment. Actually, the increase in baccalaureate degrees was slightly larger showing a factor of 2.7 (enrollment 2.6) [Table 3]. These institutions also gained a slightly larger share of the total for Pennsylvania too, with baccalaureates awarded increasing from 18 percent in 1962 to 25 percent in 1971. It would be helpful to have coherent data on degree fields but such information is available only in fragments. One of these fragments displays an intriguing condition. In 1961-62, the state-owned colleges provided 51 percent of the initial teacher certifications.[45] Despite the new name of 'State Colleges' and the conscious effort to add liberal arts or professional majors, these institutions provided even more, 54 percent, of the teacher certifications in 1970-71. This is not to say that the change in mission (Table 7) for these institutions has had no effect

or an adverse one. Among the graduates of the state-owned institutions, a decreasing share have actually been entering education, a drop from 60 percent to 55 percent between 1961-62 and 1970-71. However, this is a small change and clearly demonstrates that the roots of major innovation lie deep within institutions rather than with name changes or a few new programs.

D. Ratio of Enrollment to Degrees (Figure 5)

We have already noted the value of this index as an indicator of 'efficiency' or of 'success rate.' It is a qualitative indicator that tells something of how the system is working when compared to an 'ideal.' The state-owned institutions have made good progress over the years, particularly since 1960 as the ratio dropped from 5.0 to 4.5 (Table 6). They have reached the point where further improvements in degree output will be small and made only by careful policy decisions. The direction of further improvement in this degree ratio below the excellent level of 4.5 lies with careful articulation with community and junior colleges. The existence of these two-year institutions helps in two ways. They offer options to students who are uncertain or unready for four-year programs. They produce candidates proven by two years of study for admission at the junior level. Both these elements should reduce dropouts and delays thereby improving the degree ratio of four-year institutions even further.

The quality of the State College performance comes through strongly in comparison with Pennsylvania institutions. In a fairly typical year, 1968-69, the national ratio was 6.4; the State ratio 5.5; and the state-owned group 4.5. The full range of data show that our subject institutions have improved themselves steadily over the years to the point where the present performance is excellent.

VIII. BACCALAUREATE ORIGINS OF DOCTORAL RECIPIENTS (Figure 6)

An indication of the position of an undergraduate institution in this mainstream of American education is the number of baccalaureates who go on to complete their doctorates. Initial studies of this relationship by Knapp, Goodrich, and Greenbaum, elaborated in subsequent work and refined by Astin and Panos, showed that certain undergraduate schools had remarkable success in producing scholars who went on to complete advanced degrees.[46]

Over the years, the National Research Council, acting for the National Academy of Sciences and the National Academy of Engineering, has collected information about each new crop of doctorates. One piece of information is the institution at which they received their first degree. By special arrangement, the Center for the Study of Higher Education at The Pennsylvania State University obtained the data on doctorates for all the state-owned colleges and for a representative group of private colleges in the State. The number of doctorates in all fields and the percent of that number in education is displayed in Table 8. To give a clearer picture of growth rates, the total number of doctorates who had their baccalaureate preparations in the fourteen state-owned institutions is plotted on a semi-logarithmic graph, (Figure 6).

The state-owned institutions were not of important or even significant source of doctorates until recently—since 1965. It is more than coincidence that the upward trend began when the first classes educated under the State College rubric graduated. Growth rates have been rapid but a leveling effect can be anticipated as doctoral support falls off. Among the state-owned institutions, there are large differences between Cheyney, Clarion, and Mansfield, among the lower contributors to the doctoral pool, and there is no clear correlation with enrollment level even though Indiana and West Chester stand at the top of the list. Obviously, the relationship between undergraduates and subsequent doctoral study is complex or individualized to the point where only detailed study can give definitive answers. As the programs offered by our subject institutions expand, this index of doctoral origins may prove to be a useful measure of progress.

IX. SUMMARY AND CONCLUSIONS

A. Findings

1. Enrollment at the undergraduate level in the state-owned institutions has increased almost nine times since 1925 and by 2.6 times in the 1960's.

2. The rate of enrollment increase for these institutions has been greater than the average growth rate for U.S. or Pennsylvania and they now enroll 21 percent of the undergraduates in the Commonwealth compared to 18 percent ten years ago.

3. Degree output at the baccalaureate level for the state-owned institutions has increased slightly faster than enrollment and they award 25 percent of these degrees granted by institutions within the Commonwealth.

4. The change to a State College status has had little effect on the share of teacher certifications in the State provided by state-owned institutions, now at about 54 percent, up from 51 percent ten years ago. These are indications that fewer of those prepared for teaching now enter the profession. This signifies that teacher preparation is serving as general education rather than its intended purpose.

5. The ratio of enrollment to degrees has improved steadily in the state-owned institutions to a low of 4.5 in 1971. This reflects a good level of efficiency that is substantially better than the all-state level, 5.5, and much better than the national condition, 6.5.

6. Graduates of state-owned institutions have appeared on the Survey of Current Doctorates only recently in significant numbers but the number of students completing advanced study has increased rapidly.

Throughout their first century, the destiny of the state-owned colleges in Pennsylvania was bound into the development of the public schools. The growth of the collegiate institutions reflects the long, steady parallel rise in the school population and the educational level of the nation. Most recent effects on the colleges have come from the expansion of secondary education, largely since 1920. This growth brought new qualitative changes in teacher preparation as the colleges responded to increasing scientific and technical sophistication, to needs for special education and guidance, and to the rapid pace of social change. Basically, the State Colleges have served their designed purpose of increasing the professional competence of personnel in the public schools.

In the last fifteen years, another social force has acted upon these state-owned institutions. The democratization of opportunity for higher education has resulted in exceptional growth in public institutions. The idea was consistent with their tradition. Jencks and Riesman noted that throughout the U.S. these colleges have been a valuable avenue of education for women at times when other segments of higher education presented limitations of curriculum and career options.[47] For other groups as well, they have afforded a good basic general education and the share of teacher-trained graduates entering other fields has increased reaching more than 35 percent in recent years.[48] This means, of course, that these institutions have become a significant source of trained personnel for the larger business and professional world. By their location, they have also offered accessible opportunity in areas of the Commonwealth not conveniently served by other types of colleges and universities. Lower fees at these institutions have encouraged students who might not have considered college study and, what is more, they have done so without the elaborate administration required by extensive institutional financial aid programs. More open policies of admission have further extended opportunity to those with modest or less consistent academic records.

These colleges have done well in responding to societal mandates. The measures used here, degrees, enrollment, and the ratio between them, are few but they are significant educational indicators of that response. The state-owned institutions increased their enrollments

as rapidly as public policy would allow. They improved their 'efficiency' steadily throughout the recent decades and they continued their role in teacher training throughout the years of shortage. Still, there is another aspect to this history. The State Colleges have been much affected by the societal climate. Economic depressions and downturns, wars and the return from wars, these have had drastic effects on enrollment.

B. The Future

The features which are clear in retrospect fade rapidly as one turns toward the future. A primary motivating force, the rapid rise in school age population and the extension of public school opportunities to an increasing share of that population, is now history. The great public school movement, a century-long trend, has ended its rapid growth. The impact of new student cohorts of ever increasing size is past and, although post-secondary enrollments will grow, their effects will be shared by a wider range of institutions, notably the vo-tech schools and two-year colleges.[49]

A new role for the state-owned institutions has been forming for a dozen years, partly in answer to these changes, partly in response to local demand for new skills and knowledge in business, public administration, health, and human services. A limited number of new programs has been developed at these institutions largely through the initiative of administrative leadership at individual colleges. Programs have had to be built up from the resources at hand, stretching faculty competence, using facilities on a makeshift basis, and tying in with usable community facilities where possible. Formal acknowledgement of these new social needs has been slow, as the wording of the Master Plan of 1971 demonstrates. In the absence of formal acknowledgement, particularly in the form of stated public policy and comprehensive public planning, these institutions cannot hope to undertake the full range of alterations required to meet the educational demands of the next two decades. Those changes for which full public acknowledgement are need include: faculty development programs to create new areas of competence within existing faculty structures, organizational innovations that will provide efficient administration for new programs, modification of facilities and equipment to support advanced preparation in specialized areas, and new avenues of liaison with the college or university service area.

The engine of growth lies now in the knowledge-based character of our society. Pressure for more education will come more and more from new bands in the occupational-professional spectrum. For the individual, one phase—his education and his re-education—will be related to employability even though there will by other reasons, as there have always been, for higher education. Clearly, the state-owned institutions must move rapidly toward training for a wider range of occupational-professional competence. In their present configuration, these institutions are limited to teacher education, general liberal arts, and whatever other programs ingenuity can construct. Such a policy of containment, if pursued literally, will inevitably result in large numbers of unemployable college graduates. Teacher demand is limited: general education has become, since 1969, insufficient.[50] And the specialized programs now operating cannot achieve full value without careful cultivation.[51]

C. Summary

Enrollment at the state-owned institutions has increased more rapidly than the state or national average for the period 1961-1971. The degree output at the baccalaureate level has grown even more rapidly. Taken together as a ratio, these two indicators demonstrate a substantial increase in efficiency for these institutions that exceeds national and state averages. While they have made progress in preparing those who later complete the doctorate, their contribution is not yet large when compared to the traditional liberal arts colleges. Clearly the state-owned colleges have steadily improved their efficiency and their contribution to the educational resources of the Commonwealth.

Their historical role has been rooted in the expansion of the public school and democratization, two long term trends now approaching stability. Current and future demands of society are rooted in the knowledge-based quality of occupational-professional practice. The link between the established competence of these institutions and the changing economic demand lies in new formulations of public policy which recognize a changed mission and new planning designs which develop long-range support.

– FOOTNOTES –

[1]Ben Lawrence, George Weathersby, Virginia W. Patterson, *Outputs of Higher Education*, Boulder, Colorado (Western Interstate Commission for Higher Education) July 1970. This series of papers explores a variety of approaches. A WICHE commission on outcomes is continuing the evaluation of various indexes and indicators appropriate to colleges and universities.

[2]E. A. Dunham, *Colleges of Forgotten Americans*, New York, McGraw-Hill Book Co., Inc., 1969, pp. 36-37.

[3]J. P. Wickersham, *A History of Education in Pennsylvania*, Lancaster; Inquirer Publishing, 1886, p. 608; L. C. Walsh and M. T. Walsh, *History and Organization of Education in Pennsylvania* (privately published), printed by: Indiana, Pennsylvania: R. S. Grose Printing Shop, 1930, p. 321; S. Sack, *The History of Higher Education in Pennsylvania* (V.11), Harrisburg: Pennsylvania Historical and Museum Commission, 1963, p. 513.

[4]Frederick Rudolph, *The American College and University*, New York, Vintage Books, 1965 (originally 1962), pp. 186-187.

[5]W. A. Cornell, *The Historical Development of the Patterns of Appropriations for Institutions of Higher Education by the General Assembly of Pennsylvania to 1960*, The University of Buffalo (unpublished dissertation) 1962, pp. 2-3.

[6]A. E. Meyer, *An Educational History of the American People*, New York: McGraw-Hill, 1967, p. 121.

[7]E. A. Dunham, *Forgotten Americans*, p. 29.

[8]L. C. Walsh and M. T. Walsh, *History and Organization of Education in Pennsylvania*, p. 321.

[9]S. Sack, *The History of Higher Education in Pennsylvania* (V.11), Harrisburg; Pennsylvania Historical and Museum Commission, 1963, p. 513.

[10]Act 202, *Laws of Pennsylvania*, 1830-31.

[11]J. P. Wickersham, *A History of Education in Pennsylvania*, p. 608.

[12]M. L. Borrowman, *Teacher Education in America*, New York: Teachers College Press, 1965, pp. 1-3.

[13]S. Sack, *History of Higher Education*, p. 519.

[14]S. Sack, *History of Higher Education*, p. 526.

[15]Act 619, *Laws of Pennsylvania*, 1857.

[16]W. A. Cornell, *Historical Development*, p. 72.

[17]S. Sack, *History of Higher Education*, p. 539.

[18]L. C. Walsh and M. T. Walsh, *History and Organization*, p. 323.

[19]W. A. Cornell, *Historical Development*, p. 97.

[20]W. A. Cornell, *Historical Development*, p. 102.

[21]S. Sack, *History of Higher Education*, p. 539.

[22]Public Law 309, *Laws of Pennsylvania*, 1911.

[23]E. O. Holland, *The Pennsylvania State Normal Schools and Public School System*, New York: Teachers College Press, 1912, p. 5.

[24]L. C. Walsh and M. T. Walsh, *History and Organization*, p. 338.

[25]Act 552, *Laws of Pennsylvania*, p. 608.

[26]Pennsylvania State Board of Education, *1971 Master Plan for Higher Education in Pennsylvania*, Harrisburg, 1971, p. 31.

[27]A. D. Hall, R. E. Fagen, "Definition of a System" in N. Buckley's *Modern Systems Research for the Behavioral Scientist*, Chicago, Aldine, 1968, p. 81.

[28]D. Katz, R. Kahn, *The Social Psychology of Organizations*, New York, John Wiley & Sons, Inc., 1966, p. 18.

[29]Ivan Illich, *Deschooling Society*, New York, Harper & Row, 1970. Illich's work represents the most extreme attack on the school form.

[30]M. Woodhall and Mark Blaug, "Productivity Trends in British University Education—1938-1962, "MINERVA," September, 1965, pp. 483-498.

[31]David O. Brown, "A Scheme for Measuring the Output of Higher Education" in Lawrence, Weathersby, Patterson *The Outputs of Higher Education*, pp. 29-30.

[32]David W. Breneman, "An Economic Theory of Ph.D. Production," Paper P-8, June 1970, Office of the Vice President - Planning & Analysis - University of California, Cal., p. 3. Also, see p. 22 on the 'Step Change' aspects.

[33]Charles F. Carter, "The Efficiency of Universities," *Higher Education*, Vol. 1, No. 1, February 1972, p. 78.

[34]F. E. Balderston, "Thinking About the Outputs of Higher Education," Lawrence, Weathersby, Patterson, *The Outputs of Higher Education*, p. 14.

[35]Select Committee on the Future of Private and Independent Higher Education in New York State, *New York State and Private Higher Education*, Bureau of Publications, Albany, N.Y., January 1968, "The Bundy Report."

[36]Frank Bowles, *Access to Higher Education*, Vol. 1 UNESCO, Columbia University Press, New York, 1963. See chart on Page 77 for a graphic illustration of the effects of this philosophy.

[37]Lewis B. Mayhew, "Higher Education, Work, and The Professions: An Introduction," *Journal of Higher Education*, XLIII, 3, March '72, pp. 169-178. Using cohort analysis California found in 1967, five freshmen were required to produce a bachelor's degree four years later. In 1967, the number had increased to six.

[38]John C. Griffiths, *A Potential Measure of Performance for University Systems*, University Park, Pa., Vice President, Office for Planning, The PSU, February 1970, p. 1.

[39]Seymour E. Harris, *A Statistical Portrait of Higher Education*, New York, McGraw-Hill Book Co., 1972, p. 346.

[40]Robbin R. Hough, "The Outputs of Undergraduate Education," *The Outputs of Higher Education*, WICHE, Boulder, Col., 1970, pp. 93-104.

[41]David W. Breneman, "An Economic Theory of Ph.D. Production, The Case at Berkeley," Paper P-8, Office of Vice President: Planning and Evaluations, University of California, June 1970, p. 5. This analyst emphasizes another aspect of the relationship between degree output and the preparatory stages. (In the present context, 'efficiency' is defined as the ratio of degree output to the input of doctoral student time. Thus, a relatively 'inefficient' department would be marked by an excessively large average time to degree and/**or** a high rate of attrition, particularly if the attrition typically occurs after students have spent several years in the program.)

[42]National data are drawn from: K. A. Simon, M. M. Frankel, *Projections of Educational Statistics to 1980-81* (1971 edition), Washington, D.C., National Center for Educational Statistics, Office of Education, 1972. State data from: R. G. Hummel, et al. *Projections, Selected Educational Statistics for Pennsylvania*, Harrisburg, Pennsylvania, Pennsylvania Department of Education, 1972.

[43]*The Chronicle of Higher Education*, January 3, 1972, p. 4.

[44]Harris, *Statistical Portrait of Higher Education*, pp. 342-343.

[45]Hummel et al, *Projections*, Table 10.

[46]R. H. Knapp, H. B. Goodrich, *Origins of American Scientist*, Chicago, 1952; R. H. Knapp Joseph Greenbaum, *The Younger American Scholar: His Collegiate Origins*, Middletown, Connecticut, 1953; R. H. Knapp, *The Origin of American Humanistic Scholars*, Englewood Cliffs, New Jersey, 1964; A. W. Astin, " 'Productivity' of Undergraduate Institution," *Science*, April 13, 1962, pp. 129-135.

[47]C. Jencks, D. Riesman, *The Academic Resolution*, Garden City, New Jersey, Doubleday, 1968, p. 231.

[48]Pennsylvania Department of Education, *Calculator*, Vol. XII, No. 12, August 1971, Summary of NEA Teacher Supply and Demand Study.

[49]Frank M. Durkee, "Teacher Manpower Demand and Supply for Elementary and Secondary Schools in Pennsylvania" (mimeograph), Pennsylvania Department of Education, Harrisburg, Pennsylvania, 1971 (September).

[50]Ivan Berg, *Education and Jobs: The Great Training Robbery* (N.Y., Praeger, 1970).

[51]None of these issues is peculiar to Pennsylvania but other states, notably New York, have moved to meet them. See G. Lester Anderson's "The University's Colleges and Occupational-Professional Education" (mimeo), Office of the Provost, State University of New York, July 1970.

TABLE 1

Enrollments, Full-Time Undergraduate, State-Owned
Institutions of Pennsylvania
1925 to 1971

- - - -

Actual Enrollment
by Institution

Institution	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Bloomsburg	606	715	752	739	712	686	668	681	642	601	580	622	713	673	700	681
California	401	600	655	624	676	847	773	741	673	666	657	745	761	641	712	733
Cheyney	66	83	101	134	139	159	154	189	172	160	150	156	157	150	188	203
Clarion	204	286	246	209	280	308	306	375	368	263	267	229	204	215	280	321
East Stroudsburg	557	695	796	856	796	763	762	778	716	609	579	555	580	536	517	550
Edinboro	492	588	644	591	621	628	609	570	535	439	319	302	312	266	314	290
Indiana	965	1151	1273	1356	1425	1554	1566	1517	1381	1273	1285	1360	1357	1215	1354	1440
Kutztown	351	459	436	459	579	477	494	541	531	435	456	489	505	477	506	500
Lock Haven	263	398	434	426	476	529	568	601	586	475	408	432	426	364	403	395
Mansfield	564	658	801	821	818	815	755	767	716	645	617	624	602	579	583	601
Millersville	387	533	519	551	526	497	534	599	581	523	573	534	535	536	531	505
Shippensburg	412	518	562	616	675	740	691	677	628	483	408	416	476	460	503	515
Slippery Rock	433	591	673	747	852	892	862	968	879	796	686	683	691	573	587	591
West Chester	1150	1101	1139	1225	1303	1389	1428	1404	1251	1183	1139	1234	1303	1387	1620	1622
TOTAL--ALL STATE COLLEGES	6851	8376	9031	9354	9878	10284	10170	10408	9659	8549	8124	8381	8622	8072	8798	9007

SOURCE: Statistical Reports of the Superintendent of Public Instruction for reporting periods 1930-1967; Statistical Reports of the Secretary of Education for reporting periods 1968-1971.
[Except as indicated]

Table 1 (cont.)

Institution	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Bloomsburg	599	421	294	313	207	341	747	780	869	894	857	800	795	744	882
California	631	490	379	189	197	418	676	1001	763	1220	737	825	668	656	876
Cheyney	216	218	156	142	144	212	330	374	384	396	415	348	389	410	510
Clarion	325	267	236	146	153	261	650	665	740	764	732	587	506	454	578
East Stroudsburg	509	468	363	212	267	503	802	891	971	1004	944	782	765	763	910
Edinboro	274	217	197	116	124	170	508	505	561	590	578	452	407	384	461
Indiana	1448	1281	1205	782	733	988	1413	1522	1549	1650	1620	1562	1580	1587	1732
Kutztown	470	393	309	249	262	383	607	692	821	897	950	843	781	736	818
Lock Haven	430	341	265	173	202	361	704	726	646	686	619	488	524	543	648
Mansfield	554	474	388	240	198	298	650	700	790	768	717	581	571	555	573
Millersville	550	480	339	197	196	380	625	758	767	825	803	705	694	727	896
Shippensburg	491	397	293	177	192	332	703	754	745	792	763	676	635	629	741
Slippery Rock	572	455	358	204	207	430	641	765	849	914	903	796	800	795	865
West Chester	1586	1413	1202	808	834	1251	1760	1827	1806	1840	1769	1649	1718	1749	1850
TOTAL--ALL STATE COLLEGES	8655	7315	5978	3948	3916	6328	10816	11960	12231	13260	12457	11094	10833	10732	12340

Table 1 (cont.)

Institution	a/ F1955	F1956	F1957	F1958	F1959	F1960	F1961	F1962	F1963	b/ F1964	c/ F1965	F1966	F1967	F1968	F1969	F1970	F1971
Bloomsburg	958	1078	1187	1472	1675	1737	1932	1971	2167	2335	2848	3033	3197	3397	3550	3954	4239
California	955	1096	1192	1632	2563	2205	2667	2746	2958	3239	3811	4002	4203	4536	5097	5098	4931
Cheyney	513	562	569	725	794	833	879	911	996	1216	1509	1621	1788	1933	1856	1835	2184
Clarion	621	688	764	996	1099	1346	1750	2133	2484	2316	2795	2874	3030	3206	3432	3463	3697
East Stroudsburg	948	1023	1095	1269	1269	1415	1587	1721	1740	1818	1993	2046	2145	2174	2397	2824	2911
Edinboro	623	769	876	1140	1147	1413	1725	1991	2195	2468	3072	3758	4270	5208	5839	5615	5922
Indiana	1974	2193	2382	3001	3112	3087	3442	3872	4321	4301	5181	6063	6992	7561	8592	8866	8763
Kutztown	859	921	959	1248	1620	1470	1730	1796	1998	2464	2676	2914	3240	3557	3966	4097	3901
Lock Haven	642	782	793	969	1110	1073	1253	1358	1400	1538	1622	1776	1961	2147	2314	2375	2324
Mansfield	624	685	681	917	988	1011	1147	1225	1357	1643	1903	2101	2479	2565	2806	2993	3014
Millersville	1052	1218	1368	1535	1658	1751	1892	2046	2253	2505	2893	3107	3282	3684	3876	4174	4225
Shippensburg	893	1066	1137	1259	1316	1317	1447	1616	1832	2187	2640	2951	3097	3515	3711	3711	3906
Slippery Rock	899	901	1033	1278	1339	1314	1505	1709	1996	2298	2783	3217	3566	3902	4046	4422	4846
West Chester	1849	1887	1910	2052	2051	2382	2651	2863	3245	3533	3998	4316	4766	5430	5807	5863	5636
TOTAL--ALL STATE COLLEGES	13460	14869	15946	19493	21741	22424	25632	27958	30942	33861	39724	43829	48016	52815	57289	59290	60499

a/ Reporting base shifted from Spring 1955 to Fall 1956 in the academic year 1955-56. To provide continuity estimates have been made of the enrollments for that missing year.

All years preceded by an "F" indicate Fall enrollments.

b/ Enrollment data for Fall 1964 entitled "Students of College Grade -- On Campus" in Statistical Report for that year.

c/ Enrollment data for Fall 1965 includes graduates and undergraduates; no separate totals reported.

TABLE 2

Full-Time Undergraduate Enrollments at
State Colleges of Pennsylvania
(1925-1929) to (1966-1970)

\- - - -

Five Year Moving Averages
To Designated Year

Institution	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
Bloomsburg	705	721	711	697	678	656	634	623	632	646	666	686	681
California	591	639	663	680	690	688	650	644	648	642	651	666	644
Cheyney	105	123	137	155	163	165	163	163	157	153	158	169	181
Clarion	245	266	270	282	327	324	316	300	266	236	239	250	269
East Stroudsburg	740	781	796	791	763	726	689	647	608	572	553	548	538
Edinboro	587	614	619	604	593	556	494	433	381	328	303	297	291
Indiana	1234	1352	1435	1484	1489	1458	1404	1363	1331	1326	1342	1345	1363
Kutztown	457	482	489	510	524	496	491	490	483	472	487	495	492
Lock Haven	399	453	487	520	552	552	528	500	466	421	407	404	404
Mansfield	732	783	802	795	774	734	694	668	635	608	595	592	578
Millersville	503	525	525	541	547	545	560	560	548	539	540	546	550
Shippensburg	557	622	657	680	682	644	577	522	482	449	453	474	489
Slippery Rock	659	751	805	864	891	879	838	802	747	686	644	625	603
West Chester	1184	1231	1297	1350	1355	1331	1281	1242	1222	1249	1337	1433	1504
TOTAL--ALL STATE COLLEGES	8698	9385	9743	10019	10080	9814	9382	9024	8667	8350	8399	8576	8631

SOURCE: Derived from Table 1 by averaging actual enrollments for five-year period up to and including each designated year.

Table 2 (Cont.)

Institution	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Bloomsburg	615	539	462	367	315	380	478	589	726	829
California	589	537	432	325	283	372	496	611	816	879
Cheyney	193	194	185	173	172	195	238	286	337	378
Clarion	282	286	259	225	213	289	375	494	610	704
East Stroudsburg	516	481	420	364	363	429	535	687	834	890
Edinboro	272	258	219	186	165	223	285	374	467	548
Indiana	1348	1346	1231	1090	998	1024	1088	1241	1424	1551
Kutztown	469	436	384	337	319	362	439	553	680	793
Lock Haven	387	367	321	282	269	341	433	528	625	676
Mansfield	558	520	451	371	320	355	417	527	641	725
Millersville	539	499	426	352	332	390	473	583	671	756
Shippensburg	473	440	375	310	278	339	432	545	665	751
Slippery Rock	556	513	436	359	331	368	449	578	720	814
West Chester	1526	1489	1326	1169	1102	1171	1296	1496	1697	1800
TOTAL--ALL STATE COLLEGES	8369	8218	7248	6230	5764	6465	7661	9318	10920	12163

Table 2 (Cont.)

Institution	1952	1953	1954	1955	F1955	F1956	F1957	F1958	F1959	F1960	F1961	F1962
Bloomsburg	840	843	818	816	836	891	970	1115	1274	1430	1601	1757
California	909	843	821	752	796	850	936	1131	1468	1738	2052	2363
Cheyney	381	384	387	406	434	477	513	576	633	697	760	828
Clarion	691	659	602	565	549	569	621	729	834	979	1176	1450
East Stroudsburg	886	861	819	800	835	883	949	1050	1121	1214	1327	1452
Edinboro	537	518	482	456	465	529	623	724	861	1019	1210	1433
Indiana	1581	1592	1600	1616	1687	1813	1974	2256	2532	2755	3005	3303
Kutztown	841	858	841	826	807	823	859	961	1121	1244	1405	1573
Lock Haven	633	593	572	564	579	638	692	742	834	910	1004	1117
Mansfield	711	685	638	599	581	602	624	696	779	856	949	1058
Millersville	772	759	751	765	815	917	1052	1214	1366	1506	1641	1776
Shippensburg	746	722	699	689	715	793	893	1019	1134	1219	1295	1391
Slippery Rock	846	853	842	833	831	852	899	995	1090	1173	1294	1429
West Chester	1778	1756	1745	1747	1764	1812	1850	1911	1951	2057	2206	2396
TOTAL--ALL STATE COLLEGES	12200	11975	11675	11491	11692	12447	13469	15222	17102	18895	21047	23450

Table 2 (cont.)

Institution	F1963	F1964	F1965	F1966	F1967	F1968	F1969	F1970
Bloomsburg	1896	2028	2251	2481	2726	2972	3215	3389
California	2628	2763	3084	3351	3643	3958	4330	4587
Cheyney	883	967	1102	1251	1426	1613	1741	1807
Clarion	1747	1991	2280	2505	2685	2829	3052	3186
East Stroudsburg	1546	1656	1772	1864	1948	2030	2146	2312
Edinboro	1644	1908	2240	2647	3103	3755	4429	4938
Indiana	3567	3805	4223	4748	5372	6020	6878	7615
Kutztown	1723	1892	2133	2370	2659	2971	3272	3556
Lock Haven	1204	1289	1399	1504	1624	1774	1929	2079
Mansfield	1146	1277	1455	1646	1897	2138	2371	2589
Millersville	1920	2089	2318	2561	2808	3094	3368	3625
Shippensburg	1506	1680	1944	2245	2541	2878	3183	3397
Slippery Rock	1573	1764	2058	2401	2772	3153	3503	3831
West Chester	2635	2931	3254	3587	3968	4405	4860	5233
TOTAL--ALL STATE COLLEGES	25739	28163	31623	35262	39274	43649	48335	52248

TABLE 3

Bachelors' Degrees Awarded at
State Colleges of Pennsylvania:
For Academic Years Commencing Designated Years
1929-30 to 1970-71

Institution	a/ 1929	a/ 1930	a/ 1931	a/ 1932	a/ 1933	a/ 1934	a/ 1935	a/ 1936	1937	1938	1939	1940	1941
Bloomsburg	47	46	48	84	106	107	91	96	141	122	146	152	137
California	23	40	68	111	126	96	124	129	99	113	173	136	151
Cheyney	N/D	N/D	4	8	20	17	27	27	40	34	28	27	35
Clarion	10	13	25	33	29	39	35	20	35	35	41	55	94
East Stroudsburg	62	82	107	118	131	136	100	88	121	93	121	93	148
Edinboro	46	76	91	81	89	70	66	36	48	73	69	81	73
Indiana	102	116	163	172	176	218	194	201	196	210	273	305	326
Kutztown	28	38	30	87	95	92	80	67	92	143	152	145	137
Lock Haven	22	43	39	42	77	63	56	43	58	83	83	91	89
Mansfield	128	144	121	127	107	119	124	82	118	119	135	122	127
Millersville	27	50	61	74	117	126	112	108	123	110	148	143	156
Shippensburg	54	70	69	91	81	100	78	77	77	98	123	129	109
Slippery Rock	67	70	90	84	120	136	97	88	93	120	108	129	134
West Chester	103	136	166	191	219	233	216	219	225	328	321	374	369
TOTAL ALL STATE COLLEGES	719	924	1082	1303	1493	1552	1400	1281	1466	1681	1921	1982	2085

SOURCE: Statistical Reports of the Superintendent of Public Instruction for reporting periods 1930-1967; Statistical Reports of the Secretary of Education for reporting periods 1968-1971. [Except as indicated]

Table 3 (cont.)

Institution	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Bloomsburg	113	71	75	50	86	104	158	275	219	171
California	165	102	80	106	123	126	195	238	208	145
Cheyney	38	30	39	22	33	36	61	90	64	62
Clarion	66	62	54	46	59	75	107	177	166	163
East Stroudsburg	109	61	59	63	120	140	222	221	216	195
Edinboro	70	58	53	39	56	74	111	114	132	135
Indiana	285	256	187	218	212	217	336	420	370	349
Kutztown	109	85	76	83	92	114	172	231	219	214
Lock Haven	80	52	42	44	91	89	149	217	163	109
Mansfield	120	124	51	43	81	78	127	214	197	153
Millersville	114	75	57	57	85	117	169	205	209	175
Shippensburg	109	62	59	62	78	92	126	216	199	137
Slippery Rock	144	102	65	63	86	113	169	222	196	185
West Chester	369	245	230	187	256	287	468	493	368	356
TOTAL ALL STATE COLLEGES	1891	1385	1127	1083	1458	1662	2570	3333	2926	2549

Table 3 (cont.)

Institution	b/ 1952	b/ 1953	b/ 1954	b/ 1955	b/ 1956	b/ 1957	1958	1959	b/ 1960	b/ 1961	b/ 1962
Bloomsburg	208	193	154	173	188	245	322	321	297	384	404
California	207	161	132	167	229	283	338	332	426	518	558
Cheyney	62	72	30	77	75	86	122	136	136	143	164
Clarion	130	106	85	120	138	267	165	165	215	265	313
East Stroudsburg	192	175	136	159	185	267	270	268	220	256	283
Edinboro	117	96	81	110	126	147	204	218	201	255	260
Indiana	390	323	315	361	400	474	544	625	644	705	691
Kutztown	232	179	187	147	202	233	239	230	284	304	316
Lock Haven	114	108	83	117	153	154	198	169	217	214	261
Mansfield	156	131	103	114	141	151	176	152	159	209	216
Millersville	165	170	159	160	195	261	359	355	357	337	385
Shippensburg	163	141	140	162	209	265	N/D	297	282	284	341
Slippery Rock	187	134	154	172	177	218	227	216	271	332	310
West Chester	432	386	353	449	430	449	452	452	468	531	582
TOTAL ALL STATE COLLEGES	2755	2434	2112	2488	2848	3500	3616	3936	4177	4737	5084

NOTES: a/ Graduates with "certificates of graduation in four year curriculums (sic)" are assumed to be equivalent to baccalaureate recipients.

b/ Degree data for these years supplied directly by registrars of respective institutions.

Table 3 (Cont.)

Institution	b/ 1963	1964	1965	1966	1967	1968	1969	1970
Bloomsburg	474	481	484	545	712	745	783	790
California	735	739	674	792	924	1084	1169	1239
Cheyney	155	216	190	210	278	343	327	293
Clarion	427	495	560	559	519	793	704	776
East Stroudsburg	359	333	367	344	404	487	552	519
Edinboro	374	433	476	437	596	800	968	1003
Indiana	876	916	958	993	1217	1428	1710	1796
Kutztown	410	450	403	459	650	658	687	817
Lock Haven	252	278	294	280	344	403	490	496
Mansfield	261	294	299	331	484	520	549	686
Millersville	448	514	527	550	710	901	913	987
Shippensburg	378	411	414	463	614	800	842	820
Slippery Rock	353	407	433	507	589	798	635	1006
West Chester	662	633	658	829	895	1040	1163	1362
TOTAL ALL STATE COLLEGES	6164	6600	6737	7299	8936	10800	11492	12590

TABLE 4

Undergraduate Enrollments, Rates of Change: United States, Pennsylvania, and Pennsylvania State--Owned Institutions

	All U.S. Institutions		All Penna. Institutions		Penna. State--Owned Institutions	
	Number	% Change	Number	% Change	Number	% Change
1971–72			378,760	(5.0%)	61,583	
1970–71	6,648,000	(4.6%)	360,634	(4.0%)	60,499	(2.0%)
1969–70	6,290,167	(3.8%)	346,279	(7.0%)	59,290	(4.0%)
1968–69	5,955,644	(4.7%)	324,975	(6.0%)	57,289	(8.0%)
1967–68	5,638,616	(5.9%)	307,439	(6.0%)	52,815	(10.0%)
1966–67	5,325,000	(6.8%)	288,522		48,016	(10.0%)
1965–66	4,984,000	(6.4%)			43,829	(10.0%)
1964–65	4,684,888	(10.5%)			39,724	(17.0%)
1963–64	4,239,305	(9.6%)			33,861	(9.0%)
1962–63	3,869,837	(7.9%)			30,942	(10.0%)
1961–62	3,585,407	(7.3%)			27,958	(9.0%)
1960–61	3,342,718	(6.8%)			25,632	(14.0%)
1959–60	3,131,393	(5.5%)			22,424	(3.0%)
1958–59	2,967,558	(13.2%)			21,741	(12.0%)
1957–58	2,621,919				19,493	(22.0%)

TABLE 5

Baccalaureate Degrees: Yearly Rates of Change: United States, Pennsylvania, and Pennsylvania State–Owned Institutions

	All U.S. Institutions		All Penna. Institutions		Penna. State–Owned Institutions	
	Number	% Change	Number	% Change	Number	% Change
1971–72			51,800	(3.5%)	13,400	(6.0%)
1970–71	865,000	(4.6%)	50,068	(5.8%)	12,590	(10.0%)
1969–70	827,234	(8.3%)	47,321	(4.7%)	11,492	(10.0%)
1968–69	764,185	(14.6%)	45,218	(16.2%)	10,800	(21.0%)
1967–68	666,710	(14.3%)	38,905	(15.5%)	8,936	(22.0%)
1966–67	583,100	(5.8%)	33,689	(6.8%)	7,299	(8.0%)
1965–66	551,040	(3.0%)	31,541	(1.7%)	6,737	(2.0%)
1964–64	535,031	(7.3%)	31,002	(2.2%)	6,600	(7.0%)
1963–64	498,654	(11.4%)	30,329	(13.9%)	6,164	(21.0%)
1962–63	447,622	(7.1%)	26,630	(6.1%)	5,084	(7.0%)
1961–62	417,846	(4.8%)	25,085		4,737	(13.0%)
1960–61	398,710	(1.6%)			4,177	(6.0%)
1959–60	392,440	(2.5%)			3,936	(9.0%)
1958–59	382,904	(8.2%)			3,616	(3.0%)
1957–58	362,554	(7.4%)			3,500	

TABLE 6

Ratio of Enrollment to Degrees

	U.S. Institutions	Penna. Institutions	Penna. State–Owned Institutions
1970–71	7.7	5.5	4.5
1969–70	7.6	5.6	4.7
1968–69	6.4	5.5	4.5
1967–68	6.8	5.8	4.9
1966–67	7.4	6.4	5.5
1965–66	7.4	6.6	5.3
1964–65	7.0		4.7
1963–64	6.8		4.6
1962–63	7.1		5.2
1961–62	7.1		5.0
1960–61	7.0		5.0
1959–60	6.7		5.0
1958–59	6.6		4.8
1957–58	6.6		4.2

TABLE 7

Preparation of Teachers for Initial Certification in Pennsylvania

	Total Certifications	State–Owned	State–Owned as % of Total
1961–62	9,434	4,826	(51.2)
1962–63	10,256	5,268	(51.4)
1963–64	11,625	6,157	(53.0)
1964–65	11,912	6,507	(54.6)
1965–66	12,354	6,533	(52.9)
1966–67	12,954	6,778	(52.3)
1967–68	15,191	8,182	(53.9)
1968–69	17,228	9,641	(56.0)
1969–70	18,182	10,148	(55.8)
1970–71	19,172	10,373	(54.1)

TABLE 8

Doctoral Recipients in U. S. With Baccalaureates at

Penna. State-Owned Institutions & Ten Representative Private Colleges

	1920-1925	1926-1930	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961-1965	1966-1970	Total
State-Owned Institutions											
Bloomsburg					2	4	14	7	29	49	105
California					4	10	22	19	31	42	128
Cheyney						1	2	1	0	2	6
Clarion					2	3	6	6	12	47	76
E. Stroudsburg				1	4	4	12	13	14	38	86
Edinboro		1			2	6	15	8	21	33	86
Indiana				1	1	9	38	29	43	115	236
Kutztown			1		1	1	9	24	23	46	105
Lock Haven				1	1	4	13	13	18	34	84
Mansfield			1	1	3	3	10	12	9	24	63
Millersville					2	8	19	13	26	56	124
Shippensburg				2	3	6	17	12	23	56	119
Slippery Rock				5	2	8	16	16	32	53	132
West Chester				1	4	12	29	32	45	71	194
Total =		1	2	12	31	79	192	205	326	666	1,544
Ten Private Colleges											
Allegheny	13	16	25	26	28	30	49	38	71	78	374
Dickinson	8	15	22	33	18	22	28	30	31	65	272
Elizabethtown			1	7	2	8	14	12	13	22	79
F & M	14	23	33	39	25	42	75	58	81	141	531
Gettysburg	17	17	13	18	20	24	28	40	43	110	330
Grove City	5	5	6	13	17	16	22	15	31	42	172
Lycoming	1		1				1	5	12	25	45
Susquehanna	2	3	10	7	6	6	11	15	10	22	92
W & J	2	10	8	23	13	24	32	22	29	65	228
Muhlenburg	8	13	16	11	15	21	39	33	45	83	284
Total =	70	102	135	177	144	193	299	268	366	653	2,407

Source: NAS-NRC Doctoral Record File

TABLE 9

Bachelors Degrees Awarded in Pennsylvania By All Institutions and By State-Owned Institutions (1961–62 to 1970–71)

	Total	State–Owned	State–Owned as % of Total
1961–62	25,085	4,793	(19.1)
1962–63	26,630	5,001	(18.8)
1963–64	30,329	6,140	(20.2)
1964–65	31,002	6,600	(21.3)
1965–66	31,541	6,737	(21.4)
1966–67	33,689	7,299	(21.7)
1967–68	38,905	8,936	(23.0)
1968–69	45,218	10,800	(23.9)
1969–70	47,321	11,492	(24.3)
1970–71	50,068	12,590	(25.2)

Source: Hummel et al., Projection 1972.

FIG. 1: UNDERGRADUATE ENROLLMENTS, BY YEAR, PENNSYLVANIA STATE-OWNED INSTITUTIONS: 1925 TO 1971 (IN THOUSANDS)

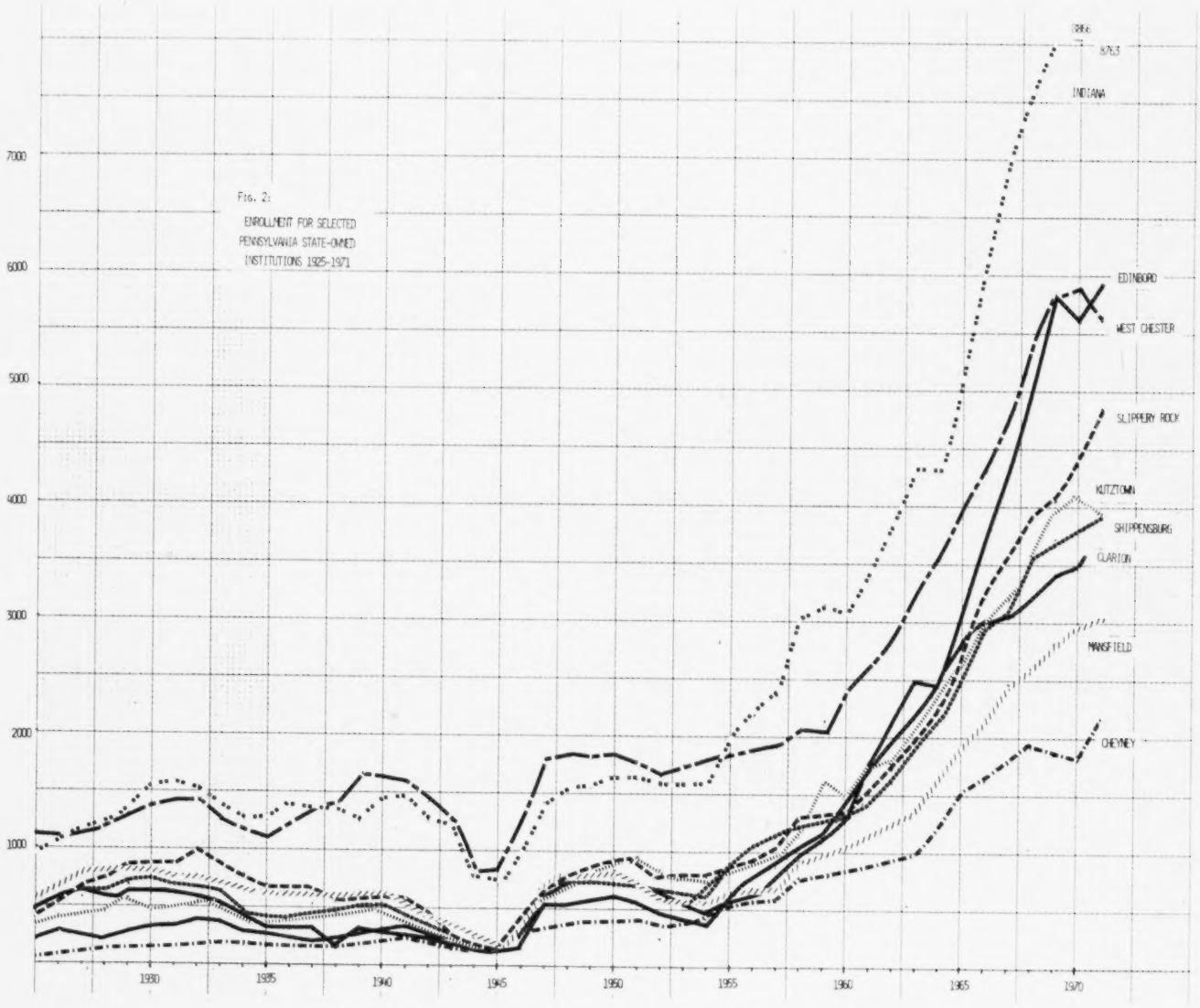


Fig. 2:
ENROLLMENT FOR SELECTED
PENNSYLVANIA STATE-OWNED
INSTITUTIONS 1925-1971
8763
INDIANA
EDINBORO
WEST CHESTER
SLIPPERY ROCK
KUTZTOWN
SHIPPENSBURG
CLARION
MANSFIELD
CHEYNEY
7000
6000
5000
4000
3000
2000
1000
1930
1935
1940
1945
1950
1955
1960
1965
1970

FIG. 3: BACHELORS' DEGREES AWARDED, BY YEAR, PENNSYLVANIA STATE-OWNED INSTITUTIONS: 1929 TO 1971 (IN THOUSANDS)

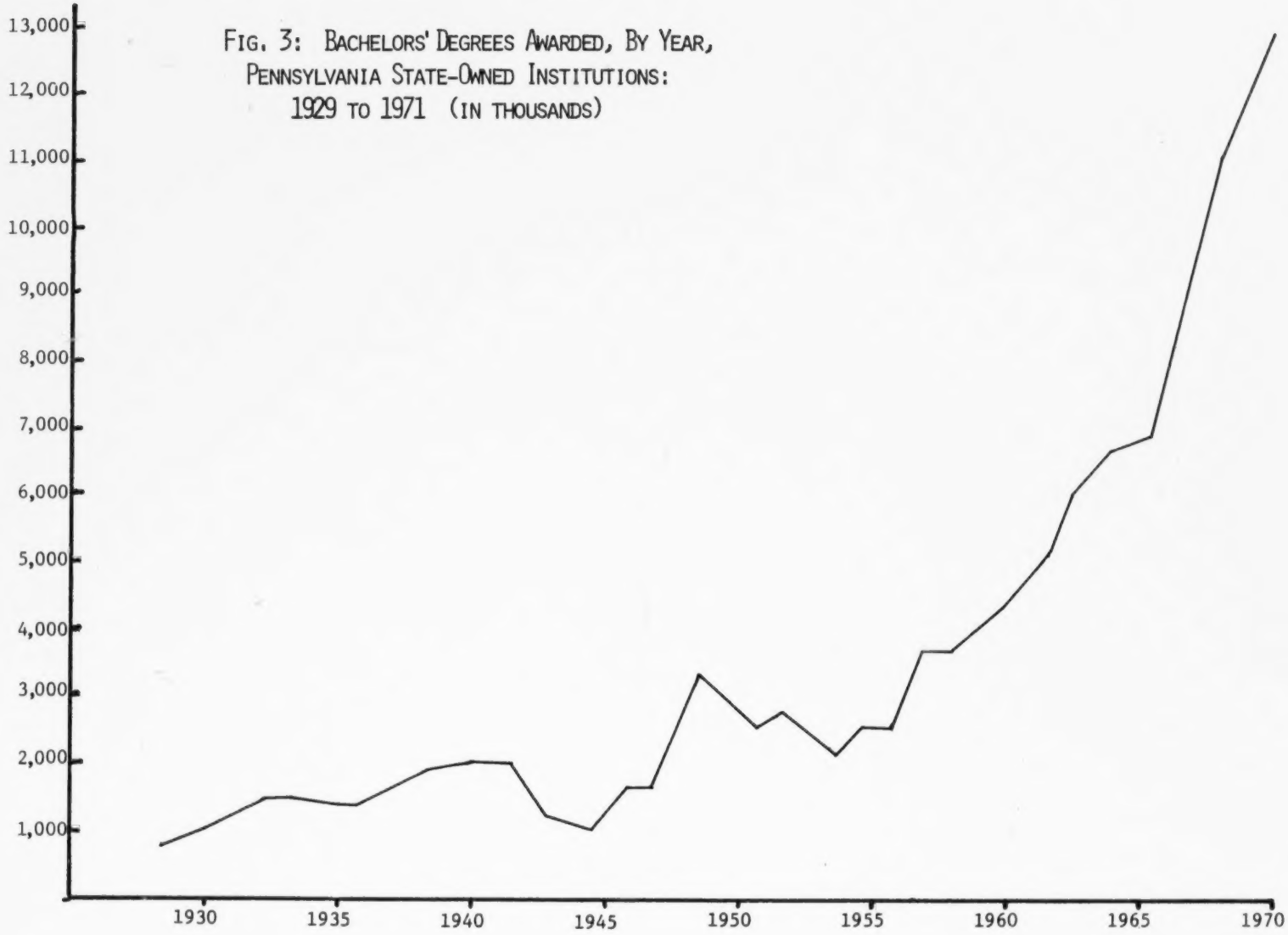


FIG. 4:

ANNUAL
RATE OF INCREASE
UNDERGRADUATE ENROLLMENT

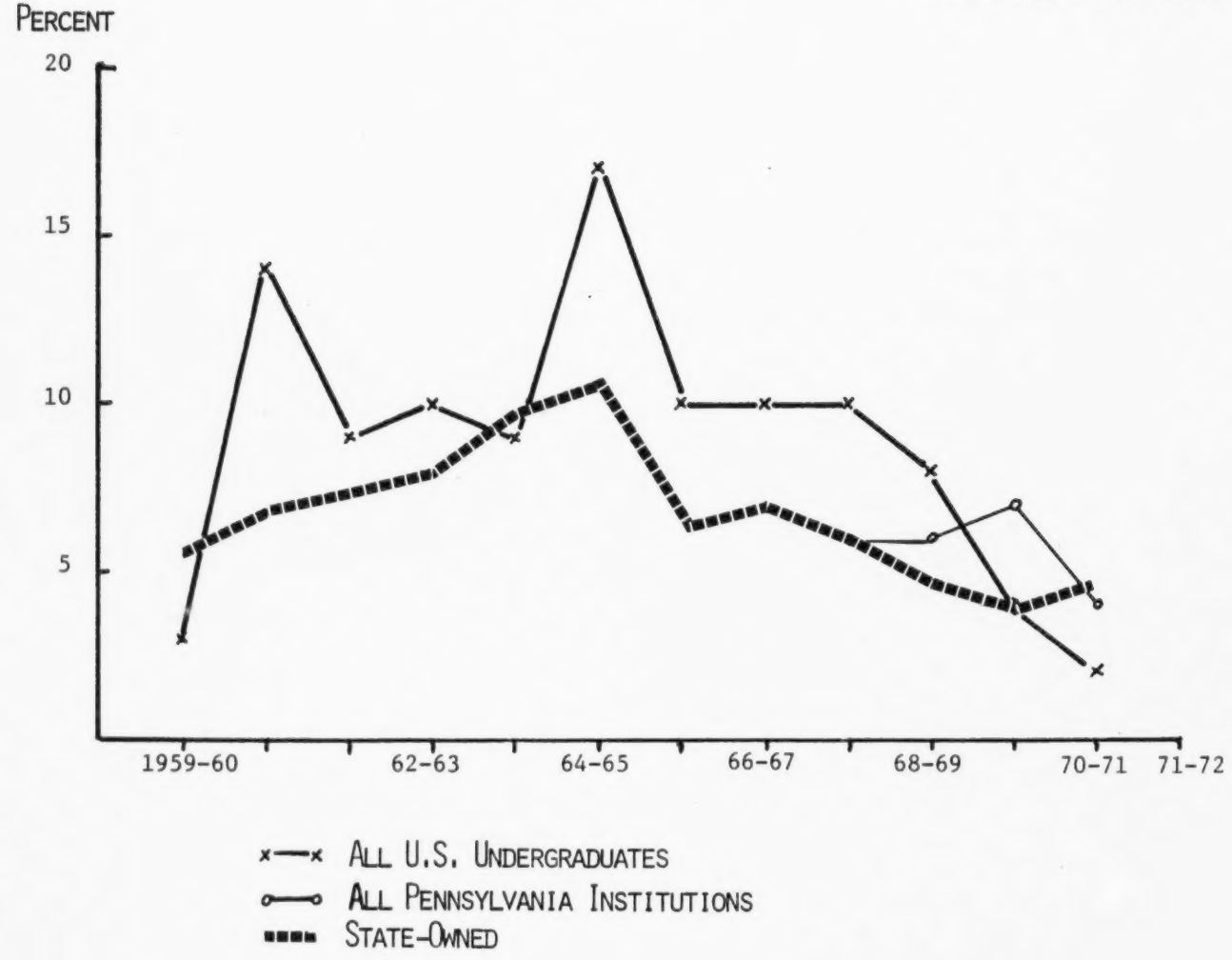


FIG. 5: RATIO OF ENROLLMENT TO DEGREES, BY YEAR, PENNSYLVANIA STATE-OWNED INSTITUTIONS: 1932 TO 1970

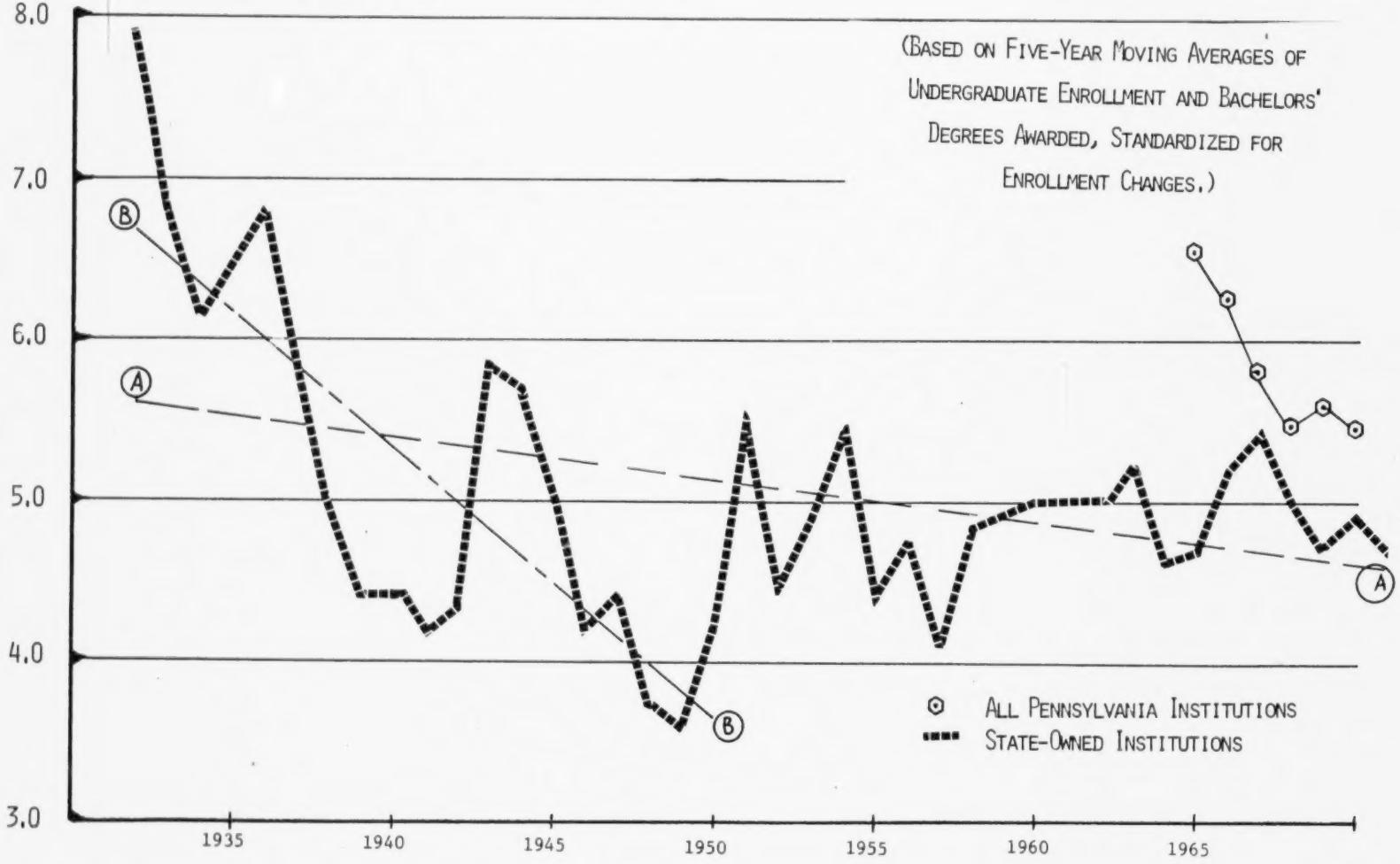
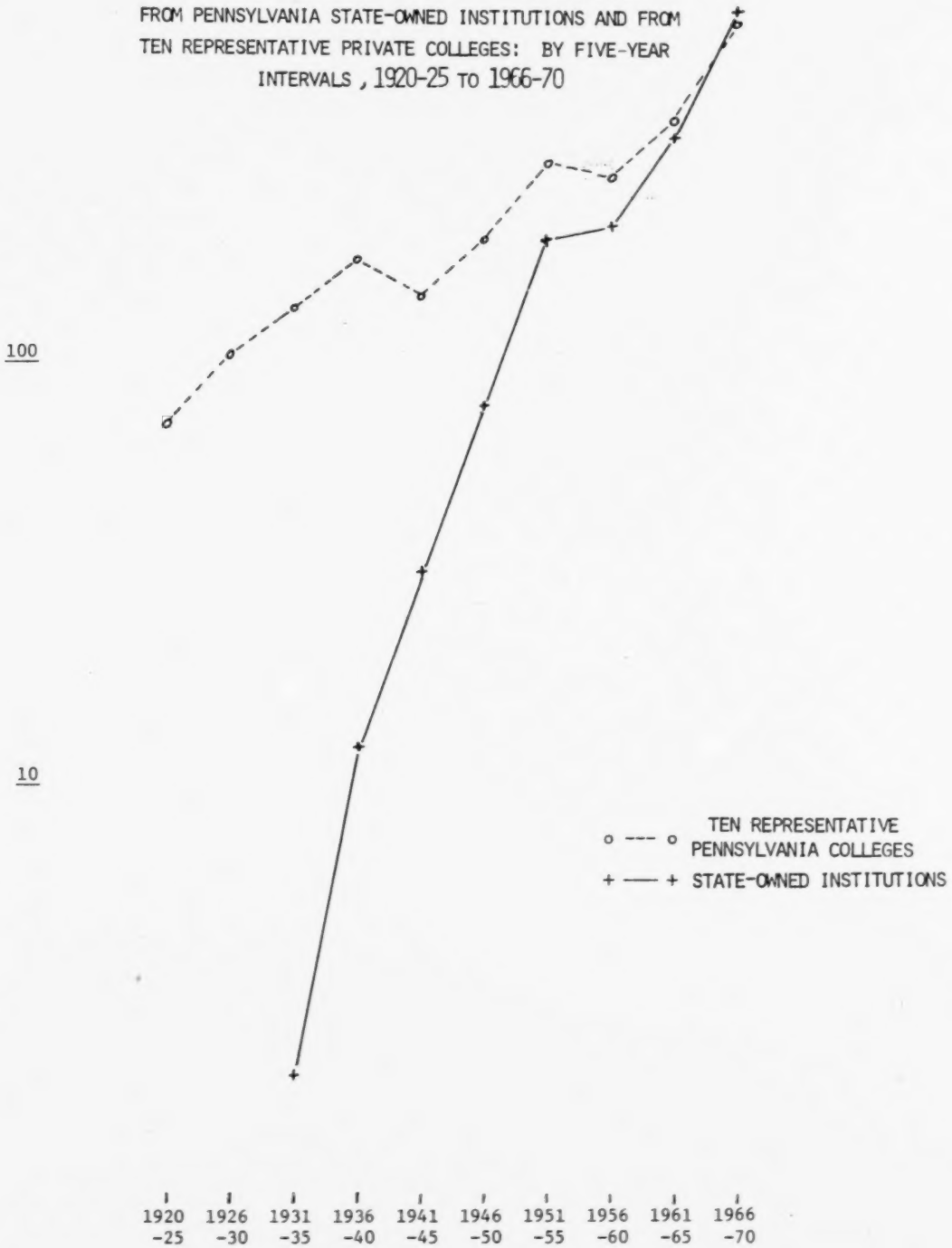


FIG. 6:

DOCTORATE RECIPIENTS IN U.S. WITH BACCALAUREATES FROM PENNSYLVANIA STATE-OWNED INSTITUTIONS AND FROM TEN REPRESENTATIVE PRIVATE COLLEGES: BY FIVE-YEAR INTERVALS, 1920-25 TO 1966-70



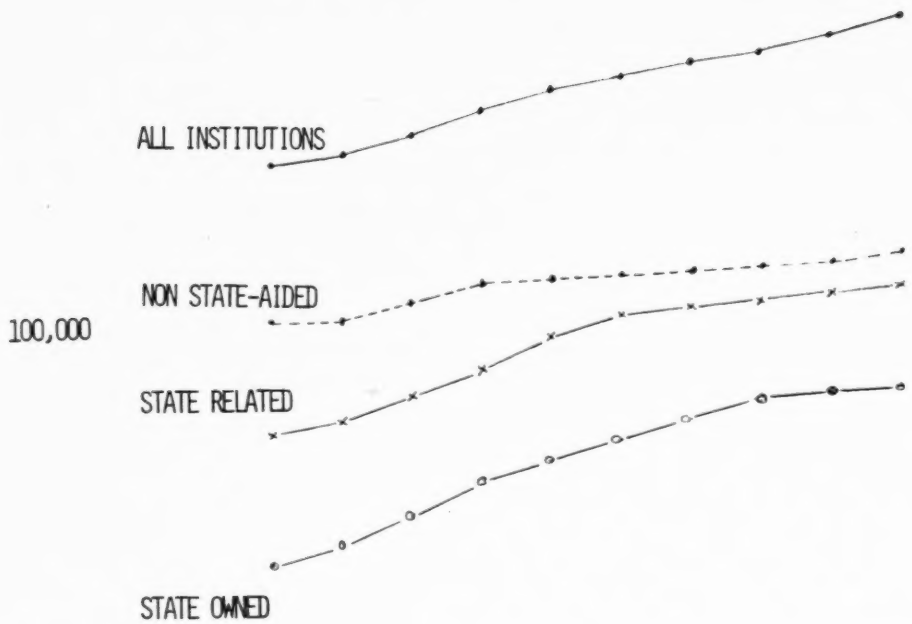


FIG. 7
UNDERGRADUATE ENROLLMENTS IN PENNSYLVANIA
BY CLASS OF INSTITUTION
1962 TO 1971 (SEMI-LOG SCALE)

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